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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/842,631	04/27/2001	Wendong Zhen	925-192	8827

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NIXON & VANDERHYE, PC
1100 N GLEBE ROAD
8TH FLOOR
ARLINGTON, VA 22201-4714

EXAMINER	
DIAZ, JOSE R	

ART UNIT	PAPER NUMBER
2815	

DATE MAILED: 05/03/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/842,631	ZHEN, WENDONG	
	Examiner	Art Unit	
	José R Díaz	2815	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *13 February 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *23,24,28 and 30-32* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *23,24,28 and 30-32* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

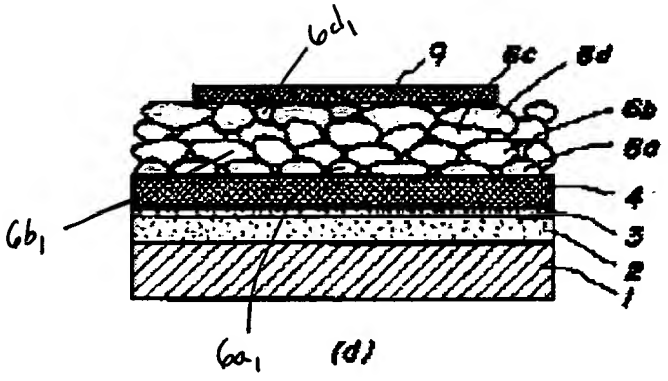
> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 23-24 and 28 are rejected under 35 U.S.C. 102(b) as being anticipated by Ogata et al. (JP 10-321809 A).

Regarding claims 23, Ogata et al. teaches a lower electrode (4) (see fig. 3d) laminated on one side to a substrate (1) (see fig. 3d), a ferroelectric thin film (6) constructed of at least three layers (see fig. 3d) including a lowermost layer (6a) (see fig. 3d), an intermediate layer (6b) (see fig. 3d), and an uppermost layer (6d) (see fig. 3d); and an upper electrode (9) only being directly laminated, on one side, to said uppermost layer (6d) (see fig. 3d), so that said intermediate layer (6b) does not directly contact either said lower electrode (4) or said upper electrode (9) (see fig. 3d), wherein a crystal grain ($6d_1$) of the uppermost layer (6d) is smaller than a crystal grain ($6b_1$) of the intermediate layer (6b) (see figure below).

Regarding claim 24, Ogata et al. teaches that a crystal grain ($6a_1$) of the lowermost layer (6a) and a crystal grain ($6d_1$) of the uppermost layer (6d) are smaller than a crystal grain ($6b_1$) of the intermediate layer (6b) (see figure below).

Regarding claims 28, Ogata et al. teaches a lower electrode (4) (see fig. 3d) laminated on one side to a substrate (1) (see fig. 3d), a ferroelectric thin film (6) constructed of at least three layers (see fig. 3d) including a lowermost layer (6a) (see figure 3d), an intermediate layer (6b) (see figure 3d), and an uppermost layer (6d) (see figure 3d); and an upper electrode (9) only being directly laminated, on one side, to said uppermost layer (3d) (see fig. 3d), so that said intermediate layer (6b) does not directly contact either said lower electrode (4) or said upper electrode (9) (see fig. 3d), wherein the lower most layer (6a) being formed of uniform minute crystal grains having small pinhole size gaps therebetween (consider the space between adjacent grains) and with a crystalline nucleus density of the lowermost layer (6a) being higher than those of the intermediate layer (6b) and an uppermost layer (6d) (see figure 3d).



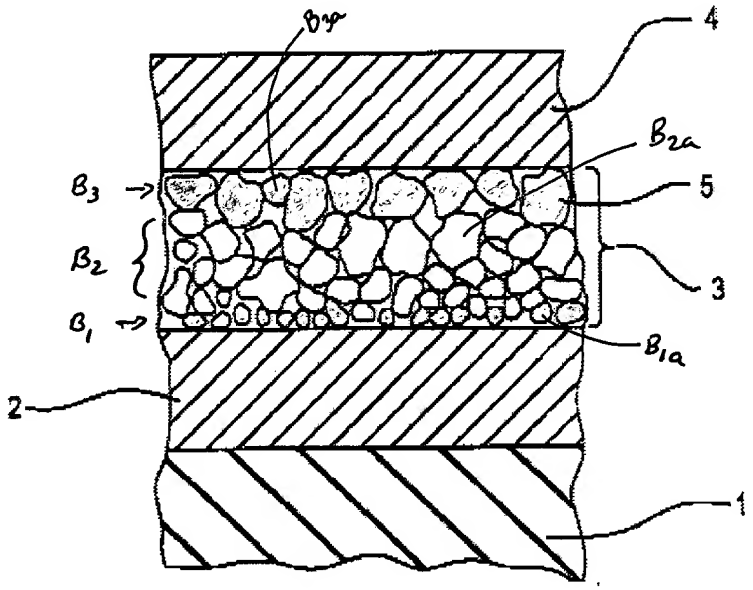
Claims 23-24 and 28 are rejected under 35 U.S.C. 102(e) as being anticipated by Shimada et al. (US Pat. No. 6,033,920).

Regarding claims 23, Shimada et al. teaches a lower electrode (2) (see fig. 7) laminated on one side to a substrate (1) (see fig. 7), a ferroelectric thin film (3) constructed of at least three layers (see fig. 7) including a lowermost layer (B_1) (see figure below), an intermediate layer (B_2) (see figure below), and an uppermost layer (B_3) (see figure below); and an upper electrode (4) only being directly laminated, on one side, to said uppermost layer (B_3), so that said intermediate layer (B_2) does not directly contact either said lower electrode (2) or said upper electrode (4) (see fig. 7), wherein a crystal grain (B_{3a}) of the uppermost layer (B_3) is smaller than a crystal grain (B_{2a}) of the intermediate layer (B_2) (see figure below).

Regarding claim 24, Shimada et al. teaches that a crystal grain (B_{1a}) of the lowermost layer (B_1) and a crystal grain (B_{3a}) of the uppermost layer (B_3) are smaller than a crystal grain (B_{2a}) of the intermediate layer (B_2) (see figure below).

Regarding claims 28, Shimada et al. teaches a lower electrode (2) (see fig. 7) laminated on one side to a substrate (1) (see fig. 7), a ferroelectric thin film (3) constructed of at least three layers (see fig. 7) including a lowermost layer (B_1) (see figure below), an intermediate layer (B_2) (see figure below), and an uppermost layer (B_3) (see figure below); and an upper electrode (4) only being directly laminated, on one side, to said uppermost layer (B_3), so that said intermediate layer (B_2) does not directly contact either said lower electrode (2) or said upper electrode (4) (see fig. 7), wherein the lower most layer (B_1) being formed of uniform minute crystal grains having small

pinhole size gaps therebetween (consider the space between adjacent grains) and with a crystalline nucleus density of the lowermost layer (B_1) being higher than those of the intermediate layer (B_2) and an uppermost layer (B_3) (see figure below).

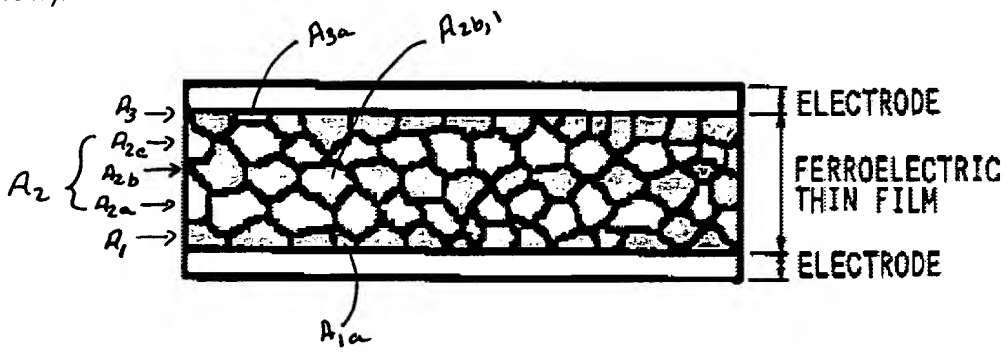


Claims 23-24 and 30-32 are rejected under 35 U.S.C. 102(e) as being anticipated by Suzuki (US Pat. No. 6,151,240).

Regarding claims 23, 30 and 32, Suzuki teaches a lower electrode (consider the "ELECTRODE" under the ferroelectric thin film in fig. 7) laminated on one side to a substrate (1) (see abstract), a ferroelectric thin film ("FERROELECTRIC THIN FILM") constructed of at least three layers (see fig. 7) including a lowermost layer (A_1) (see figure below), an intermediate layer (A_2) (see figure below), and an uppermost layer (A_3) (see figure below); and an upper electrode (consider the "ELECTRODE" above the ferroelectric thin film in fig. 7)) only being directly laminated, on one side, to said uppermost layer (A_3), so that said intermediate layer (A_2) does not directly contact either

said lower electrode or said upper electrode (see fig. 7). Furthermore, Suzuki teaches a ferroelectric film having five layers: a lowermost layer (A_1), an uppermost layer (A_3), and three intermediate layers (A_{2a}, A_{2b} and A_{2c}), wherein a crystal grain (A_{1a}, A_{3a}) of at least one of the lowermost layer (A_1) and the uppermost layer (A_2) is smaller than a crystal grain ($A_{2b,1}$) of the intermediate layers (A_{2a}, A_{2b} and A_{2c}) (see figure below).

Regarding claims 24 and 31, Suzuki teaches that a crystal grain (A_{1a}) of the lowermost layer (A_1) and a crystal grain (A_{3a}) of the uppermost layer (A_3) are smaller than a crystal grain ($A_{2b,1}$) of the intermediate layers (A_{2a}, A_{2b} and A_{2c}) (see figure below).



Response to Arguments

Applicant's arguments with respect to claims 23-24, 28 and 30-32 have been considered but are moot in view of the new grounds of rejection.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Correspondence

Any inquiry concerning this communication or earlier communications from the examiner should be directed to José R Díaz whose telephone number is (571) 272-1727. The examiner can normally be reached on 9:00-5:00 Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas can be reached on (571) 272-1664. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JRD
4/29/04

TOM THOMAS
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800